

**CImpto
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1. A packet message source comprising:

means arranged to include a respective packet message payload in each packet message of a sequence of packet messages;

means arranged to associate a priority label with each successive packet message in said sequence in accordance with a predetermined cyclic sequence of such labels; said priority labels each representing one of a plurality of priority levels and the positions of the labels in the cyclic sequence being such as to maximise, for each label in the sequence, the number of consecutive lower priority labels between that label and the nearest label in the sequence of equal or higher priority; and

means arranged to send such packet messages.

2. A packet message source as claimed in claim 1, wherein said packet message source has an associated dynamic state and said respective packet message payload comprises a source state update message.

3. (Amended) A packet message source as claimed in claim 1 [or claim 2] further comprising:

means arranged to associate a time-to-live label with each packet message.

4. (Amended) A packet message source as claimed [any one of claims 1 to 3] in claim 1 further comprising:

means arranged to associate a packet message source identity with each packet message; and

means arranged to associate a packet message payload type setting with each packet message.

5. (Amended) A packet messaging system comprising:

a plurality of packet message sources according to [any one of claims 1 to 4] claim 1; and

a communications link interface;

said communications link interface comprising:

an input port for receiving packet messages from said plurality of packet message sources;

means arranged to read a priority label associated with each received packet message;

a queue for queuing received packet messages in descending order of their associated priority labels; and

an output port for sending each packet message at the head of said queue onto a communications link.

6. (Amended) A packet messaging system according to claim 5 [when depending on claim 3,] wherein a packet message source having means arranged to associate a time-to-live label with each packet message, and said communications link interface further comprising:

means arranged to read a packet message time-to-live label associated with each received packet message;

means arranged to associate with each respective packet message an indication of the period of time that packet message has been queued; and

means arranged to discard each packet message whose associated indication indicates that that packet message has been queued for a period of time longer than the associated packet message time-to-live label.

7. (Amended) A packet messaging system according to claim 5 [when depending on claim 3,] wherein a packet message source having means arranged to associate a time-to-live label with each packet message, and said communications link interface further comprising:

a clock; and

means arranged to replace the packet message time-to-live label associated with each packet message with an adjusted time-to-live label resulting from the addition of the value of the time-to-live label read from the packet message and the local time at which the packet was received;

and in which the means arranged to associate an indication of a period of time with each packet message, associates with at least one packet message, the result of said adjusted time-to-live read from each said packet message minus the local time at which said packet message arrived such that the means arranged to discard each packet message are so arranged to discard a packet message if said associated sum is less than or equal to zero.

8. (Amended) A packet messaging system according to claim 5 [when depending on claim 4,] wherein a packet message source includes means arranged to associate a packet message source identity with each packet message and means arranged to associate a packet message payload type setting with each packet message, and said communications link interface further comprising:

means arranged to read a packet message source identity from each received packet message;

means arranged to read a packet message payload type setting associated with each received packet message;

means arranged to test the packet message queue for a queued packet message with an associated source identity matching that of the received packet message;

means arranged to read the priority label associated with the matching queued packet message;

means arranged to sort into the queue on the basis of priority label a packet message replacing the matched received and queued packet messages, having the associated source identity of the matched received and queued packet messages, the payload of the received packet message and whichever of the associated priority label of the matched received and queued packet message represents the higher priority.

9. A packet messaging system comprising:

a plurality of packet message sources each comprising:

means arranged to include a respective packet message payload in each packet message of a sequence of packet messages; and

means arranged to send such packet messages; and

a communications link interface comprising:

an input port for receiving packet messages from said plurality of packet message sources;

means arranged to read a priority label associated with each received packet message;

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a queue for queuing packet messages in descending order of respective allocated priority labels; successive packets, considered in said sequence at each one of said plurality of packet message sources, having been allocated said priority labels in accordance with a predetermined cyclic sequence of such labels; said priority labels each representing one of a plurality of priority levels and the positions of the labels in the cyclic sequence being such as to maximise, for each label in the sequence, the number of consecutive lower priority labels between it and the nearest label in the sequence of equal or higher priority; and

an output port for sending each packet message at the head of said queue onto a communications link.

10. A method of packet messaging comprising:

including a respective packet message payload in each packet message of a sequence of packet messages;

associating a priority label with each successive packet message of said sequence in accordance with a predetermined cyclic sequence of such labels; said priority labels each representing one of a plurality of priority levels and the positions of the labels in the cyclic sequence being such as to maximise, for each label in the sequence, the number of consecutive lower priority labels between said label and the nearest label in the sequence of equal or higher priority; and

sending such packet messages.

11. A method of operating a packet messaging system including a plurality of packet message sources and a communications link interface, said method comprising:

allocating successive packets, considered in their original sequence at each one of the packet message sources, priority labels in accordance with a predetermined cyclic sequence of such labels; said priority labels each representing one of a plurality of priority levels and the positions of the labels in the cyclic sequence being such as to maximise, for each label in the sequence, the number of consecutive lower priority labels between it and the nearest label in the sequence of equal or higher priority;

queuing said packet messages in a queue in descending order of respective allocated priority labels at said communications link interface; and

sending each packet message at the head of said queue onto a communications link.

12. (Amended) A computer readable storage medium, said medium embodying computer readable code for reading into a computer and executable by said computer to perform the method of claim 10 [or claim 11].

13. A Link Manager for managing the sending of packet messages on a link;

the packet messages originating from a plurality of packet message sources;
each packet message source having an associated state; each packet message
including an associated packet message priority setting on a scale of n to m
and a packet message source state update;
each packet message having been sent by a source sending sequences of $m - n + 1$ packet messages cycling through each priority setting of said priority setting scale such that successively dropping packet messages from each sequence on a priority basis leaves the remaining packet messages of the sequence as evenly spaced with respect to the original sequence as possible;

the Link Manager comprising:

at least one packet message input port to receive such packet messages;
means arranged to read the priority setting associated with each such received packet message

means arranged to sort each such received packet message into a packet message queue on the basis of the priority setting associated with each such received packet message;

means arranged to test the link for sufficient capacity to send the packet message at the head of the queue; and

means arranged to send the packet message at the head of the queue, when the link has sufficient capacity, out through at least one output port onto the link.

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14. A method of managing the sending of packet messages from a plurality of sources on a link;

the packet messages originating from a plurality of packet message sources; each packet message source having an associated state; each packet message including an associated packet message priority setting on a scale of n to m and a packet message source state update;

each packet message having been sent by a source sending sequences of $m - n + 1$ packet messages cycling through each priority setting of said priority setting scale such that successively dropping packet messages from the sequence on a priority basis leaves the remaining packet messages of the sequence as evenly spaced with respect to the original sequence as possible;

the method comprising:

receiving such packet messages at at least one input port of a link manager;

reading the priority setting associated with each such received packet message;

sorting each such received packet message into a packet message queue on the basis of the priority setting associated with each such received packet message; and

sending the packet message at the head of the queue out through at least one output port of the link manager onto the link.

15. A signal comprising a sequence of ~~packet~~ messages, each packet message including a respective packet message payload and an associated priority label; each said priority label representing one of a plurality of priority levels, the priority labels being allocated to the successive packet message in accordance with a predetermined cyclic sequence of such labels, the positions of the labels in the cyclic sequence being such as to maximise, for each label in the sequence, the number of consecutive lower priority labels between that label and the nearest label in the sequence having equal or higher priority.

16. A signal according to claim 15, wherein each packet message has an associated time-to-live label.

17. (Amended) A signal according to claim 15 [or claim 16], wherein each packet message includes an associated packet message source identity and an associated packet message payload type setting.